

Group Scombroidei

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The Mackerel - Like Fishes

Body various in form and profile. Caudal peduncle constricted, usually slender and strong. Head variable, compressed, pointed or obtuse. Snout, eyes, mouth and dentition variable. Gill membranes often separate, sometimes joined, seldom connected to isthmus. Gills 4. Gill rakers variable, slit behind last gill arch. Branchiostegals few. Skeleton firm to flexible. Premaxillaries mostly extended and pointed, not protractile. Shoulder girdle joined with cranium by well forked post-temporal, which free from cranium. Vertebrae 24 to 100 or more, most numerous

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in pelagic species. Ribs normal.
Intestinal canal mostly short.
Scales small, or minute, cycloid,
or wanting, occasionally modified
as rough or bony plates, seldom
ctenoid. Lateral line variable,
usually waved or with front
arch and hind portion straight,
not evenly arched, occasionally
absent. Dorsal usually long,
spinous part usually less or shorter
than soft part, sometimes absent.
Spines seldom strong, usually
like soft rays. Anal usually
long or like soft dorsal. Caudal,
more or less forked, sometimes
wanting. Pectorals variable, long
or short. Ventrals below pectorals,
sometimes partly abdominal, rays
few to many, sometimes rudimentary
or absent.

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A great group of homogeneous fishes, mostly marine, with imperfect limitations. Many forms show divergences to various percoids, chaetodontiformes, etc.

Most are of large size and important as game or food fishes, therefore of commercial or economic importance.

Analysis of Families

- a. Premaxillaries not protractile.
- b. Esophagus without lateral sacs, papillae or teeth.
- c. Body more or less elongate; scales variously small, rudimentary or absent; dorsal elongate, single or divided, without free spines; no free anal spines.
- d. Pseudobranchiae present.
- e. Scambriformes. Bones of snout not extended in form of sword.
- f. Caudal fin present.
- g. Soft dorsal and anal distinct from spinous part, front rays forming more or less distinct lobe.
- h. Body moderately long, fusiform; caudal peduncle with distinct keel; finlets always present; ventral with spine and 5 rays.
- i. Adipose eyelids developed, broad; caudal peduncle without median lateral keel. Scambridae.
- i.² no adipose eyelids; caudal peduncle with median lateral keel.

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f.¹ Snout short; mouth small,
maxillary reaching $\frac{1}{2}$ in eye;
gill rakers long, fine, 15 to 39
below; fins large; pectoral and
lobes of soft dorsal and anal
often greatly extended. Thunnidae.

f.² Snout longer; maxillary
reaches mostly beyond eye;
gill rakers absent or few, 9
or 10 below; fins mostly small,
caudal large. Scomberomoridae.

h.² Body elongated; caudal peduncle
without keel; finlets present or
absent; ventral with spine and
5 rays or variably reduced. Gempylidae.

g.² Soft dorsal and anal more or less
continuous with spinous dorsal,
front rays not forming distinct
lobe; ventral rudimentary. Lepidopidae.

f.² Caudal absent, body tapering to point;
dorsal and anal long, low, continuous;
ventrals rudimentary or absent;
dentition very strong. Trichiuridae.

e.² Xiphiiformes. Bones of snout extended
in a sword; scales minute or rudimentary.

h. Teeth absent with age; scales absent; ventrals absent. Xiphiidae.

h. Teeth, scales and ventrals developed. Istiophoridae.

d. Coryphaeniformes. No pseudobranchia; body oblong; snout short and very deep; scales very small; dorsal without spinous part, all rays branched and articulated, begins as crest on head. Coryphaenidae.

c. Bramiformes. Body deep; pseudo-branchial present; scales moderate or large, strongly imbricate, with extensions, which in certain parts at least, serve to connect rows of scales; dorsal and anal elongate, without distinct spinous divisions.

l. Ventrals thoracic. Bramidae.

l. Ventrals jugular. Pteraclidae.

b. Stromateiformes. Esophagus with lateral sacs; body compressed; gill membrane free or attached to isthmus; spinous dorsal and ventrals rudimentary or absent; caudal deeply forked.

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m. Scales moderate or small, cycloid, often deciduous; spinous dorsal, when distinct, shorter than soft dorsal.

n. Ventrals present throughout life; oesophagus with longitudinal plications.

Centrolophidae.

n. Ventrals present only in young, disappear with age; oesophagus with longitudinal plications.

Stromateidae.

m. Scales rhomboid, in oblique transverse series, persistent; spinous dorsal long.

Tetragonuridae.

a. Premaxillaries more or less protractile, not beak like; scales small or absent.

o. Carangiformes, dorsal and anal spines present; body oblong or elongate.

f. Anal preceded by 2 detached spines, hidden under skin with age; body shorter to orbicular; dorsal spines joined by membranes, sometimes

obsolete with age.

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g.¹ Scales minute or obsolete, cycloid, those along lateral line sometimes armed, caudal deeply forked.

Carangidae.

g.² Scales moderate or weakly ciliate, never armed along lateral line; caudal little emarginate. Pomatomidae.

f.² No spine or undivided rays detached from rest of anal fin.

r.¹ Anal rays 30 to 33.

r.² Body elongate, partly cylindrical; head depressed, without muciferous cavities; teeth in villiform bands in jaws and on palate; anal shorter than soft dorsal.

Rachycentridae.

r.² Body elongately ovoid, strongly compressed; villiform teeth in jaws and on palate; soft dorsal greatly shorter than anal. Kurtidae.

r.² Anal rays 20 to 22; body oblong, compressed; head above with muciferous cavities; prominent canines in front of jaws; anal longer than soft dorsal. Lactariidae.

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o.³ Meniiformes. Dorsal and anal
spines absent with age; anal
much larger than dorsal; body
strongly compressed, very deep,
triangular; scales not visible
with naked eye; mouth small,
vertical; preopercle entire;
first ventral ray compressed and
extended with age. Menidae.

a.³ Leiognathiformes. Premaxillaries
exceedingly protractile; lateral
line unmarked; first dorsal short;
anal spines not detached. Leiognathidae.

Family Neombridae

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Body elongate, fusiform, usually little compressed. Caudal peduncle very slender or constricted, without keel along lateral line. Head subconic, pointed anteriorly. Snout conic. Eye advanced, with broad adipose lids. Mouth rather large, cleft laterally. Premaxillaries not protractile. Maxillary without supplemental bone. Jaw with sharp teeth, large or small. Vomer and palatines toothed or not. Preopercle entire at all ages. Gill openings very wide, gill membranes not united, free from isthmus. Gill rakers usually long. Pseudobranchiae present, large. Branchiostegals 7. Air bladder small, sometimes little

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developed or absent. Stomach sac
like. Pyloric coeca numerous.
Vertebrae 31 to 60. Scales minute,
cycloid, anteriorly not formed as
corselet. Lateral line present,
undulate, without keel on side
of caudal peduncle medianly.
Dorsal fins two, spines of first
rather weak, depressible in
groove. Second dorsal like anal,
elevated anterior lobe always
distinct, preceded by free spines.
Last dorsal and anal rays detached
and free, each formed as series
of finlets. Caudal lobes abruptly
diverging, falcate and fin adapted
to rapid motion. Anal spines weak.
Ventral with spine and 5 rays,
well developed, thoracic. Color
metallic, often brilliant and
prevailing shade steel blue.

Fishes of the high seas, widely distributed, many valued as food and the object of extensive fisheries. 18

Scombrinae, Analysis of Genera.

a.¹ Body elongated, fusiform;
mandible shorter, $1\frac{3}{4}$ to $2\frac{1}{5}$ in head; lower gill rakers 23 to 32.

Scomber.

Rastrelligerinae.

a.² Body deep, more compressed;
mandible longer, $1\frac{2}{5}$ to $1\frac{3}{5}$ in head; lower gill rakers 44, slender, feathery.

Rastrelliger.

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Genus Scomber Linnaeus

Scomber Linnaeus, Syst. Nat., ed. 10, pt. 1, p. 297, 1758. (Type Scomber scombrus Linnaeus, designated by Gill, Proc. Acad. Nat. Sci. Philadelphia, p. 125, 1861.)

Cordylus (not Gronow in reptiles) Gray, Cat. Fish Gronow, p. 163, 1854. (Type Cordylus scombrus Gray, monotypic.)

Pneumatophorus Jordan and Gilbert, Proc. U. S. Nat. Mus., vol. 5, p. 573, 1882. (Type Scomber pneumatophorus Dela-roche, tautotypic.)

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Body fusiform, rather elongate, somewhat compressed. Caudal peduncle slender, without median lateral keel, though 2 small keels each side on caudal base. Short groove in fleshy fold from each side of lower jaw near its junction with maxillary. Mouth wide. Maxillary slips below preorbital. Single row of rather small, slender teeth in each jaw and on vomer and palatines. Gill rakers long and slender. Air bladder small or absent. Pyloric appendages very numerous. Vertebral 31, of which 17 caudal. Scales very small, not forming corselet. First dorsal of 9 to 12 feeble spines, interdorsal space greater than base of spinous dorsal.

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Follow Lit

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Xystaema, 227.

- abbreviata*, 232.
abbreviatus, 232.
acinaces, 238.
argyreum, 247.
baconensis, 231, 245.
darnleyense, 241.
erythroum, 237, 255.
erytrourum, 237.
japonicus, 254.
kapas, 231, 234, 236.
lucidum, 229.
lucidus, 229.
macracantha, 250.
oblongus, 242.
ovata, 244.
ovatum, 244.
oyena, 234, 236, 237, 252.
poietti, 234.
punctatum, 249, 252.
rappi, 227, 246.

Xystoema ovatum, 244.

Xyster, 204.

- fuscus*, 204, 204, 205.
nigrescens, 206.

Xysterus, 204.

Xyxtaema oyena, 237.

<slang>

Second dorsal small, followed by⁴
5 to 9 finlets. Caudal small,
widely forked. Anal like
second dorsal, with similar
finlets. Paired fins small,
pectoral high or on level with
eyes.

These fishes, the true mackerels,
are widely distributed in
temperate seas, usually in large
schools near the surface. All
are carnivorous, migratory and
valued food fishes.

waigiensis, Gerres, 247.

Kyphosus, 209, 213, 214.

Lethrinus, 51.

Pimeleoterus, 209, 210, 211.

white, Epoplosus, 437.

wolfii, Corvina, 393.

woodwardi, Hoplegnathus, 218.

Oplegnathus, 217, 218.

woodwardii, Oplegnathus, 218.

worcesteri, Nemipterus, 88.

Synagris, 85, 88.

<slug>

xanthochilus, Lethrinus, 7, 51.

xanthopleura, Heterognathodon, 80.

Pentapodus, 80.

Pentapus, 80, 82.

xanthopleuros, Heterognathodon, 80.

xanthopoda, Chrysophrys, 163, 164.

xanthopterus, Dentex, 130.

Lethrinus, 12.

xanthospilurus, Parupeneus, 309.

Pseudupeneus, 273, 309.

xanthotaenia, Lethrinus, 49.

Analysis of Species

a. Scomber. Dorsal spines 10 or 11.

b. Predorsal scales 35 to 45;

lower gill rakers ^{24 or 25.} australasicus.

b.² Predorsal scales 23 to 33.

c.¹ Lower gill rakers 21 to 25.

chrysogonus
~~magnum~~

c.² Lower gill rakers 27.

tapeinocephalus.

a.² Pneumatophorus. Dorsal spines

8 to 10; lower gill rakers 23 to 26;

predorsal scales 30 to 32.

japonicus.

viridis, Lethrinus, 5.

vitta, Pentapodus, 69, 70, 71.

○ Pentapus, 71.

vittata, Inermia, 347.

vittatus, Emmelichthys, 347.

○ Erythrichthys, 347.

Hypeneus, 331, 334.

Mullus, 318, 334.

Pentapodus, 70.

Pentapus, 80.

Sparus, 69, 117.

Upeneoides, 300, 324, 331, 333, 334, 338, 339.

Upeneus, 320, 334.

Upenoides, 335.

vlamingii, Upeneichthys, 259, 260.

○ Upeneoides, 260.

Upeneus, 260.

vogleri, Johnius, 389, 390.

○ Otolithus, 389, 390.

Pseudosciaena, 389.

Sciaena, 389.

vulgaris, Box, 180.

○ Dentex, 85, 116.

<slug>

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Scomber australasicus Cuvier

Scomber australasicus Cuvier,
Hist. Nat. Poiss., vol. 8, p. 49,
1831 (January 1832) (type locality,
Port King George [= King George
Sound]) (on Duoy and Garnard).
— Günther, Cat. Fish. Brit.
Mus., vol. 2, p. 359, 1860 (Port
Jackson; Swan River; Ambonia).
— McCulloch, Fish. New South
Wales, ed. 1, p. 104, pl. 33, fig.
286a, 1919; Mem. Austral. Mus.,
vol. 5, pt. 2, p. 261, Sep. 10, 1929
(reference).

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Scomber australiensis Peters,
Monatsb. Akad. Wiss. Berlin, p. 836,
1876 (1877) (Amboina).

Pneumatophorus australasicus Jordan
and Hubbs, Mem. Carnegie Mus.,
vol. 10, no. 2, p. 211, June 27, 1925
(Moreton Bay; Lord Howe Island;
Hawaii; Puccoro Island).

Scomber antarcticus Castelnau, Proc.
Zool. Acclimat. Soc. Victoria, vol. 1,
p. 106, July 15, 1872 (type locality,
Melbourne market).

Scomber japonicus (not Houttuyn)
Evermann and Seale, Bull. Bur.
Fisher., vol. 26, p. 61, 1906 (1907)
(Bulan, Philippines).

Scomber colias (not Gmelin) Stead,
Fish. New South Wales, p. 94, pl. 63,
1908.

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Depth $5\frac{1}{3}$ to 6; head $3\frac{3}{5}$, width $2\frac{1}{8}$ to $2\frac{1}{5}$. Snout $2\frac{7}{8}$ to 3 in head; eye 4 to $4\frac{1}{8}$, $1\frac{1}{4}$ to $1\frac{2}{5}$ in snout, subequal or little greater than interorbital; adipose lids expose median third of eye; maxillary reaches eye, length $2\frac{1}{2}$ to $2\frac{3}{5}$ in head; interorbital $4\frac{1}{3}$ to $4\frac{4}{5}$, low, depressed to nearly level medially. Gill rakers $13 + 24$ or 25, lanceolate, equal gill filaments or $1\frac{1}{5}$ in eye.

Scales 145 to 160 in lateral line to caudal base; 16 above, 26 below, 35 predorsal forward to occiput. Basal keel of each caudal lobe $1\frac{4}{5}$ in eye.

D. X - I, $11 + 5$, first spine $2\frac{1}{8}$ to $2\frac{7}{8}$ in head, first branched ray $4\frac{1}{8}$ to $4\frac{2}{3}$; A. I - I, $11 + 5$, third branched ray $5\frac{1}{8}$ to $5\frac{1}{3}$;

Upenoides, indicus, 288.

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moluccensis, 328.

sundaicus, 323, 325.

tragula, 340.

vittatus, 335.

vagus, Chrysophrys, 145,
158.

Chrysophrys (Acanthopagrus), 158.

vaigiensis, Gerres, 226, 227.

Kyphosus, 204, 209.

Pimelepterus, 207, 209.

valenciennii, Johnius, 375.

vanicolaris, Mulloides, 262.

vanicolensis, Mulloides, 262, 270.

Mulloidichthys, 261, 262.
Upeneus, 262.
variabilis, Dentex, 127.

Synagris, 127.

variegatus, Lethrinus, 6, 19, 20, 23, 39.

Upeneoides, 340.

velifer, Upeneus, 300, 301.

versicolor, Otolithes, 354, ~~355~~.

Otolithus, 354, 355.

vinosa, Scorpiis, 213.

virgatum, Enthyopteroma, 107.

Euthyopteroma, 107.

virgatus, Dentex, 107.

Nemipterus, 107.

Sparus, 107.

Synagris, 87, 107.

slug

least depth of caudal peduncle
 10 to $10\frac{3}{4}$; caudal $1\frac{3}{5}$ to $1\frac{2}{3}$;
 pectoral $2\frac{1}{8}$ to $2\frac{1}{4}$, rays I, 22;
 ventral I, 5, fin $2\frac{2}{5}$ to $2\frac{1}{2}$ in
 head.

Back gray brown, with
 darker gray oblique or slightly
 curved streaks. Sides and
 lower surface whitish, with
 scattered faint or obscure gray
 spots on flanks. Fins brownish.

Western Australia, Victoria,
 New South Wales, Tasmania,
 Queensland, New Zealand.

preorbitalis, 267, 269..

queketti, 265.

roseus, 328.

rubriniger, 319.

russellii, 288.

russellii, 288.

saffordi, 306.

semifasciatus, 291.

signatus, 271, 282.

spilurus, 280, 282, 303.

subvittatus, 319, 324.

sulphureus, 320, 330.

sulpirius, 330.

sundaicus, 319, 323.

taeniatus, 312, 317.

taeniopterus, 320, 327.

tertrospilus, 271.

tokisensis, 321.

tragula, 320, 324, 326, 339.

tri-fasciatus, 300.

trifasciatus, 277, 295, 300, 302.

unimaculatus, 305.

vanicolensis, 262.

velifer, 300.

vittatus, 320, 334.

vlamingii, 260.

zeylonicus, 264.

Unrecorded list. 23

U.S. N. M., no. 47824. Burdekin
River, Australia. Australian
Museum. Two examples, 245 to
265 mm.

U.S. N. M., no. 56176. Bulaw.
Bureau of Fisheries (3912). Length
138 mm (caudal broken). Sex
Scamber japonicus. Evermann and
Seale give: Depth $5\frac{1}{5}$; head $3\frac{1}{4}$;
D. IX - 12 + 5; A. II, 11 + 5. The
above specimen has depth $5\frac{2}{3}$ and
clearly 10 dorsal spines.

U.S. N. M., no. 93123. New South
Wales. Brown and Filmer. Two,
90 to 175 mm.

Upeneus, 259, 318, 319.

arge, 320, 335, 338.

arinuag, 314.

atherinoides, 265.

atrocingulatus, 277, 278,

barberinoides, 276, 317.

barberinus, 272, 277, 283.

barberoides, 276.

bensasi, 319, 321.

biaculeatus, 315.

bifasciatus, 291. 300, 311.

bilineatus, 313.

bitaeniatus, 335.

bivittatus, 330.

brandesii, 275.

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chrysecros, 305.

chryseridros, 309.

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chryserydros, 305, 309.

chryserythrus, 305.

chrysonemus, 312.

chrysopleuron, 315.

cinabarinus, 314.

cinnabarensis, 314.

cinnabarinus, 314.

crassilabris, 315.

cyclostoma, 304.

cyclostomus, 304.

cyprinoides, 316.

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Scomber japonicus Houttuyn

Scomber japonicus Houttuyn,
Verh. Holland. Maatsch. Wet.
Haarlem, vol. 20, p. 331, 1782

(type locality, Japan). —

Bonnaterre, Tabl. Ichth., p. 138,
1788 (Japan). — Gmelin, Syst.

Nat. Linn., vol. 1, p. 1329, 1789

(Japan Sea). — Walbaum,

Artedi Pisc., vol. 3, p. 223, 1792

(copied). — Lacépède, Hist. Nat.

Poiss., vol. 2, p. 599, 1800 (no

locality); vol. 3, p. 45, 1802

(Japan). — Schneider, Syst.

Ichth. Bloch, p. 37, 1801 (copied).

— Cuvier, Hist. Nat. Poiss., vol. 8,

p. 54, 1831 (copied).

The present work is the first report of the percoid series of fishes collected by the Albatross Philippine Expedition of 1907-09. We have limited it to the more typical perch like families, of which the Cheilodipteridae and Serranidae are far more extensive in both species and series of specimens. Both are, likewise, most diverse in specific variation with respect to color, while the Serranidae alone are extreme in individual variation. The Chandidae are on the contrary the most homogeneous. With this feature in view the senior author has prepared the accompanying figures, showing some of the more striking cases where extensive

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— Bleeker, Verh. Batavia. Genoot.
(Nat. Ichth. Jap.), vol. 25, p. 14,
1853 (reference). — Günther, Cat.
Fish. Brit. Mus., vol. 2, p. 356,
1860 (reference). — Jordan and
Evermann, Proc. U. S. Nat. Mus.,
vol. 25, p. 336, 1902 (Formosa); Bull.
U. S. Fish Comm., vol. 23, pt. 1, p.
169, 1903 (1905) (Hilo; Honolulu).
— Jordan and Richardson, Mem.
Carnegie Mus., vol. 4, no. 4, p. 177,
Aug. 28, 1909 (Formosa record).
— Snyder, Proc. U. S. Nat. Mus.,
vol. 42, p. 410, 1912 (Okinawa). —
Jordan and Thompson, Mem.
Carnegie Mus., vol. 6, no. 4, p. 240,
Sep. 1914 (Osaka). — Jordan and
Starks, Ann. Carnegie Mus., vol. 11,
nos. 3-4, p. 440, nov. 5, 1917 (Colombo).

30

— Izuka and Matsuura, Cat. Zool.
Spec. Tokyo Mus., Vert., p. 161, 1920
(Tokyo). — Kishinouye, Journ.
College Agric. Tokyo, vol. 8, no. 3,
p. 403, figs. 1, 7, 16, 28, 30, March 1923
(Karafuto, Taiwan, Tanegashima,
Hondo, Chosen, Fusan). — Fowler,
Mem. Bishop Mus., vol. 10, p. 132,
1928 ("probably Pacific"; Mangsi
Island; Honolulu); Proc. Acad.
Nat. Sci. Philadelphia, vol. 81,
p. 590, 1929 (Nagasaki), p. 596 (Shang-
hai), p. 604 (Hong Kong); Hong Kong
Naturalist, vol. 2, no. 4, p. 293,
Nov. 1931 (Hong Kong). — Anonymous,
Illustrat. Jap. Aquat. Animals,
vol. 1, pl. 24, figs. 1-2, 1931.

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Pneumatophorus japonicus Jordan
and Jordan, Mem. Carnegie Mus.,
vol. 10, no. 1, p. 31, Dec. 1922 (Hawaii).
— Jordan and Hubbs, Mem.
Carnegie Mus., vol. 10, no. 2, pp. 211,
212, June 27, 1925 (Sapporo,
Takashima, Tokyo, Shizuoka,
Kushiro, Misaki, Miyazu,
Yokohama, Kobe, Yamada,
Hakodate, Nagasaki, Same,
Matsushima).

? Scomber auratus Houttuyn, Verh.
Holland. Maatsch. Wet. Haarlem,
vol. 20, p. 333, 1792 (type locality,
Japan). — Cuvier, Hist. Nat. Poiss.,
vol. 8, p. 55, 1831 (copied). — Bleeker,
Verh. Batavia. Genoot. (Nat. Ichth.
Japan), vol. 25, p. 14, 1853 (reference).
— Günther, Cat. Fish. Brit. Mus.,
vol. 2, p. 357, 1860 (reference).

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Scomber pneumatophorus major
Schlegel, Fauna Japonica, Poiss.,
pts. 5-6, p. 94, pl. 47, fig. 1, 1844.

Scomber pneumatophorus minor
Schlegel, Fauna Japonica, Poiss.,
pts. 5-6, p. 94, pl. 47, fig. 2, 1844.

Scomber pneumatophorus (not Delaroche)
Bleeker, Verh. Batavia. Genoot.
(hal. Ichth. Japan), vol. 25, p. 14, 1853
(reference). — Günther, Cat. Fish.
Brit. Mus., vol. 2, p. 359, 1860
(Cape Seas).

Scomber scaba Bleeker, Nat. Tijds.
Ind. Indie, vol. 6, p. 405, 1854 (type
locality, Nagasaki).

Scomber saba Bleeker, Verh. Batavia.
Genoot. (hal. Ichth. Japan), vol. 26, pp.
5, 95, 1857 (Nagasaki); Act. Soc. Sci.
Ind. Neerl., vol. 3, no. 3, p. 5, 1857-58
(Japan).

Scomber janesaba Bleeker, Nat. Tijds.
Ned. Indie, vol. 6, p. 406, 1854 (type
 locality, Nagasaki); Verh. Batavia
Genoot. (Nab. Ichth. Japan), vol.
 26, pp. 5, 96, 1857 (Nagasaki); Act.
Ned. Sci. Ind. Neerl., vol. 3, no. 3,
 p. 5, 1857-58 (Japan). — Günther,
Cat. Fish. Brit. Mus., vol. 2, p.
 359, 1860 (reference). — Klunzinger,
Verh. zool. bot. Gesell. Wien, vol.
 21, p. 442, 1871 (Red Sea); Vitz.
Ber. Akad. Wiss. Wien, math.-
naturnw. Kl., vol. 80, pt. 1, p. 375,
 1879 (1880) (Hobson's Bay); Fische
Roth. Meer., p. 110, 1881. — Day,
Fishes of India, Suppl., p. 700, 1888;
Fauna British India, vol. 2, p. 205,
 1889.
 — Martens, Preuss. Exped. Ost Asien, vol. 1, p.
 390, 1876 (Yokohama). — Klunzinger,

Scomber diego Gyres, Proc. Cal. Acad. Sci., vol. 2, p. 92, 1856 (type locality, Monterey; to San Diego).

Pneumatophorus diego Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, no. 2, p. 211, June 27, 1925 (California).

Scomber nam Thiollère, Fauna Woodlark, p. 171, 1857 (type locality, Woodlark Island).

Scomber colias (not Gmelin) Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 63, 1901 (Yokohama, Hakodate, Yango, Nagasaki).

Pneumatophorus peruanus Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, no. 2, p. 211, June 27, 1925 (type locality, Bay of Callao, Peru, Galapagos Islands).

Pneumatophorus japonicus diego Walford, Div. Fish Game California, Bur. Comm. Fisher., Fish Bull. no. 28, p. 72, fig. 49, 1931 (California and Lower California).

Depth 5 to $5\frac{2}{3}$; head $3\frac{1}{8}$ to $3\frac{3}{4}$, width $2\frac{1}{10}$ to $2\frac{2}{3}$. Snout 3 to $3\frac{1}{10}$ in head; eye $3\frac{4}{5}$ to $3\frac{7}{8}$, $1\frac{1}{5}$ to $1\frac{1}{4}$ in snout, greater than to subequal with interorbital; maxillary reaches $\frac{1}{5}$ to $\frac{1}{4}$ in eye, length $2\frac{1}{4}$ to $2\frac{2}{5}$ in head; interorbital $3\frac{2}{5}$ to 5, low, depressed. Gill rakers $13 + 23$ to 26, length $1\frac{1}{5}$ in gill filaments, which $1\frac{1}{5}$ in eye.

Scales 166 to 170 in lateral line to caudal base; 15 above, 25 below, 31 predorsal. Keel at base of each caudal lobe $1\frac{3}{5}$ in eye.

D. VIII or IX — II to IV, $10 + 5$, third spine $2\frac{1}{4}$ to $2\frac{2}{5}$ in head, first branched ray $3\frac{7}{8}$ to 5; A. I or II — II, 8 or $9 + 5$, first branched ray $4\frac{1}{3}$ to 5; caudal $1\frac{4}{5}$ to 2, broadly forked; least depth of caudal peduncle $8\frac{4}{5}$ to $10\frac{1}{4}$; pectoral $2\frac{1}{4}$

Tripteronodon, 186, 202.

orbis, 202.

Tripteronodinae, 186.

trivittatus, Dentex, 117.

Labrus, 117.

Pentapodus, 81.

Pentapus, 81.

Sparus, 123.

trutta, Arripis, 434, 435.

Perca, 435.

Sciaena, 433.

truttaceus, Arripis, 435.

Centropristes, 435.

tumifrons, Chrysophrys, 117, 123.

Dentex, 118, 123.

Pagrus, 123.

Raius, 123.

Sparus, 123.

Raius, 123.

typus, Banjos, 2, 3.

umbra, Sciaena, 370.

Umbrina, 407.

amblycephalus, 413.

angustilineata, 409.

capensis, 408, 410.

cirrhusa, 408.

dussumieri, 412.

Underlined Aug. 12/25

36

to $2\frac{1}{3}$, rays II, 20; ventral I, 5, length
 $2\frac{1}{4}$ to $2\frac{1}{2}$ in head.

Head and back brown, latter
with transverse dark bands or
streaks, variable and close
set. Lower surfaces silvery white.

Red Sea, Cape Colony, India,
Ceylon, Philippines, China, Formosa,
Riu Kiu, Korea, Japan,
Melanesia, Hawaii, California,
Galapagos, Peru.

Therapon rubiginosus, 350.

tokiensis, Upeneoides, 321.

Upeneus, 321.

tolu, Dentex, 84, 114.

Nemipterus, 114.

Scolopsis, 114.

Synagris, 87, 114, 115.

trachycephalus, Corvina, 406.

Johnius, 373, 406.

Sciaena, 406.

tragula, Mullus, 340.

Upeneoides, 339.

Upeneus, 320, 324, 326, 339,

Upenoides, 340.

tragulus, Upeneoides, 340.

tricuspidata, Girella, 188, 191.

Girella (Incisidens), 191.

Melanichthys, 191.

Oblata, 191.

tricuspidatus, Boops, 191.

tridentifer, Otolithus, 357, 358.

trifasciatus, Diplodus, 175, 177.

Mullus, 271, 295, 298, 300.

Parupeneus, 298, 300.

Pseudupeneus, 272, 295, 301.

Sargus, 177.

Upeneus, 277, 298, 300, 302.

tri-fasciatus, Upeneus, 300.

triglyphus, Crenidens, 191.

triglyphus, Girella (Incisidens), 191.

Ten examples. Atulayan Bay,
Luzon. June 17, 1909. Length 80 to
130 mm.

Five examples. Cotabato anchorage,
Mindanao. May 20, 1909. Length
128 to 135 mm. Mostly in poor
preservation.

One example. Hinunangan beach,
Leyte, July 30, 1909. Length 87 mm.

One example. Iloilo River tidal,
Luzon. June 18, 1909. Length 103 mm.

U. S. N. M., no. 44911. Japan. 38
Government of Japan. Length 298
to 320 mm. Two examples.

U. S. N. M., no. 22502. Awa, Japan.
Government of Japan. Length 212
mm. D. IX.

U. S. N. M., no. 48151. Hakodate.
S. Kozawa. Length 223 mm. D. IX.
Lower-gill rakers extracted.

U. S. N. M., no. 49475. Hakodate.
Albatross Collection. September 19,
1896. Length 178 to 205 mm. Three
examples. D. IX. Lower gill rakers
33.

U. S. N. M., no. 45285. Fusan, Korea.
P. L. Jouy. D. IX. Length 95 mm.

U. S. N. M., no. 52808. Hawaiian
Islands. Bureau of Fisheries
(04022). Length 394 mm. Depth $5\frac{2}{3}$.
D. IX. Lower gill rakers 26.

Tahlmel, 203.

tahlmel, Sciaena, 204.

tahmel, Pemilepterus, 212.

a | Pimelepterus, 212.

· Pimelopterus, 207, 210, 212.

Taius, 117, 118, 120.

Q tumifrons, 123.

tambuloides, Dentex, 105.

Q Synagris, 86, 105.

tambulus, Dentex, 97, 102.

tarwhine, Roughleyia, 150.

tasmanicus, Centropristes, 436.

ten-lo, Sciaena, 385, 404.

Tephraeops, 186, 197.

a | richardsonii, 197, 198.

tephraeops, 198.

zebra, 198.

tephraeops, Crenidens, 197, 198.

Q Tephraeops, 198.

teraglin, Otolithus, 368.

ternatensis, Pimelepterus, 210.

terrae-reginae, Sillago, 429, 430.

tetrospilus, Upeneus, 271.

theodori, Nemipterus, 114.

Q Synagris, 87, 110.

Underscored figs. case 12
15

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Scomber tapeinocephalus Bleeker

Scomber tapeinocephalus Bleeker,
Nat. Tijds. Ned. Indië, vol. 6, p.
407, 1854 (type locality, Nagasaki);
Verh. Batavia. Genoot. (Nal. Ichth.
Japan), vol. 26, pp. 5, 97, pl. 7, fig. 2,
1857 (Nagasaki); Act. Soc. Sci.
Ind. Néerl., vol. 3, no. 3, p. 5, 1857-58
(Japan). — Günther, Cat. Fish. Brit.
Mus., vol. 2, p. 361, 1860 (reference).

Pneumatophorus tapeinocephalus
Jordan and Hubbs, Mem. Carnegie
Mus., vol. 10, no. 2, p. (211) 212, June
27, 1925 (Iatoku Island).

Scomber colias (not Gmelin)

Jordan and Snyder, Proc. U. S.

Nat. Mus., vol. 23, p. 351, 1900 (part).

Scomber japonicus (not Houttuyen)

~~Jordan and Snyder, Proc. U. S. Nat. Mus. vol. 23, p. 1748, 1904, Yokohama, Tateyama, Kobe, Matsushima, Kishinouye, Journ. College Agric. Tokyo, vol. 8, no. 3, p. 404, fig. 29, March 1923 (part). — Tanaka, Journ. Faculty Sci. Univ. Tokyo, Zool., vol. 3, pt. 1, p. 22, no. 4, 1931 (part; reference).~~

Depth $5\frac{1}{4}$ to $6\frac{1}{2}$; head $3\frac{2}{5}$ to $3\frac{1}{2}$, width $1\frac{9}{10}$ to $2\frac{2}{5}$. Snout 3 in head from snout tip; eye 4 to $4\frac{1}{5}$, $1\frac{2}{5}$ to $1\frac{2}{3}$ in snout, subequal with interorbital; maxillary reaches eye, length $2\frac{1}{2}$ to $2\frac{2}{3}$ in head from snout tip; interorbital $4\frac{1}{8}$ to $4\frac{1}{2}$, low, depressed. Gill rakers $12 + 27$, $1\frac{1}{5}$ in gill filaments, which equals eye.

Scales 185 in lateral line to caudal base; 15 above, 25 below, 36 predorsal. Caudal heels $1\frac{2}{5}$ in eye.

D. XI - I, $11 + 5$, third spine $1\frac{9}{10}$ to $2\frac{1}{8}$ in head, first branched ray $3\frac{2}{3}$ to $4\frac{7}{8}$; A. I - I, 10 or $11 + 5$, first branched ray 4 to $5\frac{1}{5}$; caudal $1\frac{3}{4}$ to $1\frac{4}{5}$, forked; least depth of caudal peduncle $8\frac{1}{2}$ to $9\frac{1}{2}$; pectoral $2\frac{1}{5}$ to $2\frac{1}{2}$, rays I, 19;

Underscored figs. case ²²/₁₆

peronii, 128.
petersii, 85, 95.
ruber, 85, 91.
sinensis, 108.
smithii, 87, 111.
striatus, 112, 128.
sumbawensis, 86, 106.
sundanensis, 86, 97.
taeniopterus, 98.
tambuloides, 86, 105.
theodori, 87, 110.
tolu, 87, 114, 115.
upeneoides, 85, 91.
variabilis, 127.
virgatus, 87, 107.
worcesteri, 85, 88.
zysron, 85, 92.

Synistius, 227, 228, 246.

<slug>

taeniatus, Pseudupeneus, 273, 317.

Upeneus, 317, 317.

taeniolatus, Symphorus, 65, 68.

taeniotatus, Symphorus, 68.

taeniopterus, Dentex, 98, 99.

Nemipterus, 98.

Synagris, 98.

Upeneoides, ~~323~~, 327.

Upeneus, 320, 327.

ventral I, 5, fin $2\frac{1}{5}$ to $2\frac{2}{3}$ in head.

Back gray brown, with dark transverse bars, close set. Sides and below silvery white. Spinous dorsal dark gray, other fins brownish. Ventral and anal whitish.

Japan.

celebicus, 85, 93.
filamentosus, 97, 102, 128.
filiformis, 85, 96.
flaviventris, 85, 94.
flavolinea, 85, 92.
furcosus, 86, 97, 98, 99.
gaponicus, 101.
gracilis, 86, 106.
grammicus, 102.
griseus, 130.
hexodon, 85, 87.
hypselognathus, 86, 96.
hypselosoma, 123.
isacanthus, 85, 89.
japonica, 101.
japonicus, 86, 101.
lutea, 112.
luteus, 87, 112.
macronemus, 128.
mesoprion, 86, 105.
metopias, 85, 89.
mulloides, 87, 112, 115.
nematophorus, 87, 113.
nematopus, 86, 104.
nemurus, 85, 90.
notatus, 98, 100.
ovenii, 87, 111.

Under scored figs. case ~~22~~ 23

44

I have accepted this species
on the basis of Kishinouye's
variety *marusaba* with 11 or 12
dorsal spines, the dark colored
bands of the back rare found
only above the median or axial
dark lateral row of spots
extending from head to caudal
base. Below are also numerous
gray spots.

Apt. H. D. Follow Lit

underscored figs. case 22

sulcatus, Aplodon, 193.

Aptodon, 192.

sulfureus, Upeneus, 330.

sulphureus, Upeneoides, 328, 330.

Upeneus, 320, 330.sumbawensis, Synagris, 86, 106.

Dentex, 106.

sundaicus, Upeneoides, 323, 325, 326.

Upeneus, 319, 323.

Upeneoides, 323, 325.

sundanensis, Dentex, 97.

Synagris, 86, 97.

swinhonis, Chrysophrys, 164.

Sparus, 124, 164.

sydneyanum, Segutilum, 205.

sydneyanus, Kyphosus, 204, 205.

Pimelepterus, 204, 205.

Symphorus, 64, 65.forsteri, 65, 68.

spilurns, 65.

spilurns, 65.

taeniolatus, 65, 68.

taeniotatus, 68.

Synagris, 64, 69, 84, 87, 116, 145.

aurifilum, 87, 109.

balinensis, 86, 103.

balinensoides, 103.

bathybus, 86, 100.

bleekeri, 86, 99.

U. S. N. M., No. 22503. Japan.
Japanese Government. Length 410
mm. D. XI. Lower gill rakers 27.

U. S. N. M., No. 48152. Volcano Bay,
Japan. S. Kozawa. Length 130 to
132 mm. Two examples.

U. S. N. M., No. 57504. Japan.
P. L. Jouy. Length 203 mm.

spinifer, Argyrops, 143, 144.

Chrysophrys, 143.

Pagrus, 143.

Sparus, 143.

Sparus (Pagrus), 143.

spinifera, Argyrops, 144.

Aurata, 143.

splendens, Gerres, 238.

Spondylisoma, 65, 182, 183.

aenea, 182, 185.

blechii, 182, 184.

emarginata, 182, 183.

guliminda, 114.

microlepis, 182, 183.

squamosum, Pachymatopon, 212, 213.

squamosus, Opisthistrus, 213.

striata, Coryphaena, 113.

Sciaena, 408, 410.

Umbrina, 410.

striatus, Dentex, 112.

Lethrinus, 7, 50.

Sparus, 68.

Synagris, 112, 128.

subfasciatus, Gerres, 228, 244.

submaculatus, Otolithus, 357.

subvittatus, Mullus, 324.

Upeneoides, 324.

Upeneus, 319, 324.

Scomber colias Cetti

Scomber colias Cetti, Fauna Sardinica,
p. 31, 1784 (type locality, Sardinia).
— Gmelin, Syst. Nat. Linn., pt. 1, p.
1329, 1789 (copied). — Schneider,
Syst. Ichth. Bloch, p. 22, 1801 (copied).
— Cuvier, Hist. Nat. Poiss., vol. 8, p.
39, pl. 209, 1831 (Naples, Messina,
Sardinia).

— Steindachner and Döderlein,
Denks. Akad. Wiss. Wien, math.-
naturw. Kl., vol. 49, pt. 1, p. 177,
1885 (part).

→ Gilchrist and Thompson, Linn.
South African Mus., vol. 6, p. 246,
1908-10 (Natal); Ann. Durban
Mus., vol. 1, pt. 4, p. 393, May 21, 1917
(reference). — Fowler, Proc. U. S.

Scomber colias Cetti

Scomber colias Cetti, Fauna Sardinica,
p. 31, 1784 (type locality, Sardinia).
— Gmelin, Syst. Nat. Linn., pt. 1, p.
1329, 1789 (copied). — Schneider,
Syst. Ichth. Bloch, p. 22, 1801 (copied).
— Cuvier, Hist. Nat. Poiss., vol. 8, p.
39, pl. 209, 1831 (Naples, Messina,
Marseilles, Nice). — Günther, Cat.
Fish. Brit. Mus., vol. 2, p. 361, 1860
(Lisbon). — Steindachner, Sitzs. Ber.
Akad. Wiss. Wien, math.-naturw. Kl.,
vol. 57, pt. 1, p. 989, 1868 (Chile). —
→ Gilchrist and Thompson, Ann.
South African Mus., vol. 6, p. 246,
1908-10 (Natal); Ann. Durban
Mus., vol. 1, pt. 4, p. 393, May 21, 1917
(reference). — Fowler, Proc. U. S.

1909.
Lava
Bay.
mm

22148. Cebu market. August 28, 1909.

Length 59 mm. Male with buccal oval (Lisbon).

4 examples [D. 5360]. Manila Bay. Head. W. is

February 8, 1909. Length 25 to 59 mm. vol. 57, pt.

Gilchrist

St. St. St.

39, pl. 20

Marseille

Fish. Br.

(Lisbon)

Head. W. is

vol. 57, pt.

47

Nat. Mus., vol. 56, p. 290, 1919 (Cape
of Good Hope). — Barnard, Ann.
South African Mus., vol. 21, pt. 2,
p. 764, pl. 30, fig. 2, Oct. 1927
(Table Bay; False Bay; Natal). —
Fowler, Proc. Acad. Nat. Sci.
Philadelphia, vol. 86, p. 441, 1934
(Natal).

Pneumatophorus colias Jordan and
Hubbs, Mem. Carnegie Mus., vol. 10,
no. 2, p. 211, June 27, 1925 (Naples;
Canaries).

48

Scomber lacertus Walbaum,
Artedi Pisc., vol. 3, p. 209, 1792
(on Cetti) (Scomber lacerta Pallas
1811 not involved).

Scomber pneumatophorus De la
Roche, Ann. Mus. Hist. Nat.,
Paris, vol. 13, pp. 315, 339, 1809
~~— Cuvier, Hist. Nat. Poiss., vol. 3, p. 38, 1831 (Balearics) — Günther,~~
(type locality, Ivica). — Cat.
Fish. Brit. Mus., vol. 2, p. 359,
1860 (Cape Seas; St. Helena; Madeira).
— McCoy, Prodr. Zool. Victoria,
dec. 3, pl. 28, 1879. — Waite, Mem.
Austral. Mus., no. 4, p. 70, 1899
(New South Wales coast).

1 example. Tarang, southern Mindanao.
May 23, 1908. [638.]

2031. Talise Island, north of
November 9, 1904.
Celebes. Length 35 to 47 mm. [2031]

Type, No. , U. S. N. M. and 10

paratypes. Color hyaline pearl.

Brownish red stripe from snout to
eye, another from eye to throat,
another across nape and 3 downward
from spinous dorsal base, latter
more or less olivaceous. Abdominal
regions and lower side of head
with more or less silver. Iris
very pale pink. Spinous dorsal
mottled finely with brownish, other
fins immaculate.

Scomber macrophthalmus Rafinesque,
Indice Itt. Sicil., p. 20, 1810 (type
locality, Sicily) (error).

Scomber macrophthalmus Rafinesque,
Indice Itt. Sicil., p. 53, 1810 (Sicily).

Scomber grey mitchell, Trans. Lit.
Philos. Soc. New York, vol. 1, p. 422,
1815 (type locality, New York). —
Cuvier, Hist. Nat. Poiss., vol. 8, p.
45, 1831 (New York, Brazil, St.
Helena, Canada, Martinique, Cape
of Good Hope). — Bleeker, Nat.
Tijds. Ned. Indie, vol. 21, p. (50, 53)
67, 1860 (Cape of Good Hope). —
Castelnau, Mém. Poiss. Afrique
Australe, p. 38, 1861 (Table Bay). —
Pappe, Synop. Fish. South Africa,
ed. 2, p. 17, 1866 (Table Bay).

Pneumatophorus grey Jordan and
Hubbs, mem. Carnegie Mus., vol. 10,
 no. 2, p. 211, June 27, 1925 (Wood's Hole,
 Mass.)

? Scomber capensis Cuvier, Hist. nat.
 Poiss., vol. 8, p. 56, 1831 (type locality,
 Cape of Good Hope).

Scomber maculatus Couch, Ann.
 Mag. Nat. Hist., vol. 5, p. 22, fig. 8,
 1832.

Scomber undulatus Swainson, Nat.
 Hist. Animals, vol. 2, p. 409, 1839
 (type locality, coasts of Sicily).

Scomber gracilis Swainson, Nat. Hist.
 Animals, vol. 2, p. 410, 1839 (type
 locality, coasts of Sicily).

57
Scomber scombrus (not Linnaeus)
Bleeker, Nat. Tijds. Ned. Indie,
vol. 21, p. 53, 1860 (reference only).

Scomber dekayi Storer, Fishes of
Massachusetts, p. 130, 1867 (type
locality, Massachusetts coast).

Depth $5\frac{2}{5}$ to 6; head $3\frac{2}{5}$ to $3\frac{3}{5}$, width 2 to $2\frac{1}{8}$. Snout $2\frac{4}{5}$ to 3 in head from snout tip; eye $3\frac{2}{5}$ to 4, 1 to $1\frac{1}{2}$ in snout, greater than interorbital; maxillary reaches eye or slightly beyond, length $2\frac{1}{2}$ to $2\frac{3}{5}$ in head; interorbital $4\frac{1}{8}$ to $4\frac{1}{3}$, level. Gill rakers $14 + 32$, finely lanceolate, equal gill filaments or $1\frac{1}{2}$ in eye.

Few enlarged scales below and behind pectoral base.

D. XII—I, $11 + 6$, third spine $2\frac{1}{8}$ in total head length, first ray $4\frac{1}{8}$ to $4\frac{1}{5}$; A. I, $12 + 5$, first ray $4\frac{2}{5}$ to $4\frac{1}{2}$; caudal $1\frac{2}{5}$ to $1\frac{3}{5}$, forked; least depth of caudal peduncle $9\frac{3}{4}$ to $9\frac{4}{5}$; pectoral $2\frac{1}{6}$ to $2\frac{1}{5}$; ventral $2\frac{1}{4}$ to $2\frac{2}{5}$.

53

Back neutral black, below
silvery white. Sides below
lateral line well spotted with
deep gray to neutral. Iris
gray, with golden. Dorsals
dusky. Caudal dark gray.
Pectoral dark gray basally
and large dark gray
terminal blotch, medially
pale. Ventral and anal
white.

Cape of Good Hope, Natal, New
South Wales, Victoria, Chile.

Also in the north and eastern Atlantic
and the Mediterranean.

pale or whitish. Under surface of head tinged pale yellowish. Barbels and lips pale. Dorsal and caudal grayish, other fins pale with light gray tints.

A. N. S. P., no. 58046. Chüing Mai, North Siam. February 8, 1934. Length 163 mm. Type.

A. N. S. P., nos. 58047 and 58048 paratypes, same data. Length 168 to 198 mm.

Related to Osteochilus vittatus (Valenciennes), with which it agrees in most all its structural characters. They, however, differ in their obscure coloration, without any black lateral band and no dark spots on the dorsal, except an obscure one at the base of each membrane. The pear-shaped organs on the end of the snout differ from those shown on Bleeker's figure.

54
The brief and imperfect
account of Scomber capensis
Cuvier, said to differ from Scomber
grey in the finer teeth, more
numerous and more serrated
hardly renders it identifiable.

Plectropomus. Plectropomus truncatus new species. Cephalopholis
albomarginatus new species. Anthias albofasciatus new species.
Callopleysiops new genus. Callopleysiops niveus new species.
Callopleysiops argus new species.

As in the case of the collections previously reported upon these were obtained by dredging, seining, trapping, dynamiting the reefs, as well as by the use of submarine light at night and by the purchase of market material.

Great credit is due to the scientific staff, consisting of Dr. Hugh M. Smith, director of the expedition; F. M. Chamberlain, naturalist; Lewis Radcliffe, assistant naturalist; C. E. Wells, ship's clerk; and K. Ito, artist; for to their efforts we owe not only the splendid preservation of the material, but ichthyologists are also deeply indebted to them for the large number of color notes which accompany the specimens. These notes were based upon living material or upon specimens as soon after death as possible. In many instances these color notes were supplemented by color sketches made by K. Ito. These color notes are printed in the text and are cited with the tin-tag field number attached to the specimen upon which they were based.

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A. N. S. P., two examples. Durban,
 Natal. 1929. H. W. Bell Harley.
 Length 260 to 265 mm.

A. N. S. P., nos: 32757 to 32760.
 Sea Isle City, New Jersey. 1906.
 W. J. Fox.

Mediterranean, West and South Africa, Natal, Zululand, Madagascar, Arabia.

53021 A.M.S.P. Natal coast.
H. W. Bell Marley ^{1925.4} Length 188 mm.

Diplodus noct (Valenciennes)

Vargus noct (Jenyns) Valenciennes,
Hist. nat. Poiss., vol. 6, 1830, p. 51. Suez.
¹_m Rüppell, Neue Wirbelth. Fische, 1835,
p. 110 (Suez; Ind.). ¹_m Günther, Cat. Fishes
Brit. Mus., vol. 1, 1859, p. 444 (Red Sea).
¹_m Klunzinger, Verhand. zool. bot. Gesell.
Wien, vol. 20, 1870, p. 749 (Suez, Red Sea).
¹_m Day, Fishes of India, pt. 1, 1875, p. 133,
pl. 32, fig. 5 (Suez; Ind.). ¹_m Klunzinger,
Fische Roth. Meer., 1884, p. 45. ¹_m Day,
Fauna British India, Fishes, vol. 2, 1889,
p. 36, fig. 14. ¹_m Jugmayer, Abhandl. K.
Bayer. Akad. Wiss., math.-physik.
Klasse, vol. 26, band 6, 1913, p. 11 (Mekran).

Scomber chrysazonus Rüppell

Scomber chrysazonus Rüppell, Neue
 Wirbelth. Fische, p. 37, pl. 11, fig. 1,
 1835 (type locality, Red Sea). —
Günther, Cat. Fish. Brit. Mus.,
 vol. 2, p. 360, 1860 (reference). —
Peters, Monatsb. Akad. Wiss. Berlin,
 p. 836, 1876 (1877) (Bougainville Island).

Scomber microlepidotus Rüppell,
neue Wirbelth. Fische, p. 38, pl. 11,
fig. 2, 1835 (type locality,
— Cantor, Journ. Asiatic Soc.
Bengal, vol. 18, pt. 2, p. 1087, 1849
(1850) (Pinang). — Günther, Cat.
Fish. Brit. Mus., vol. 2, p. 361,
1860 (China; Pinang). — Kner,
Reise Novara, Fische, p. 143, 1865
(Hong Kong; Nicobars). — Klunzinger,
Verh. zool. bot. Gesell. Wien, vol.
^{Playfair, Fishes of Zanzibar, p. 66, 1866 (Zanzibar; Aden).}
21, p. 443, 1871 (Red Sea). — Day,
Fishes of India, pt. 2, p. 250, pl.
54, figs. 3-5, 1876 (India; Madras;
^{Martens, Preuss. Exped. Ost Asien, vol. 1, p. 390, 1876 (Amoy; Bangkok).} — Day,
Andaman ^{Fishes,} Fauna of British
India, vol. 2, p. 203, fig. 71, 1889.
— Elera, Cat. Fauna Filipinas,
vol. 1, p. 506, 1895 (Cavite; Santa
Cruz; Luzon; Batangas; Masugbo).
— Jordan and Seale, Bull. Bur.
Fisher., vol. 26, p. 12, 1906 (1907)

58

(Cavite). — Evermann and Seale,
Bull. Bur. Fisher., vol. 26, p. 61,
1906 (1907) (Bacon). — Seale and
Bean, Proc. U. S. Nat. Mus.,
vol. 33, p. 241, 1907 (Zamboanga).
— Jordan and Richardson, Bull.
Bur. Fisher., vol. 27, p. 248, 1907
(1908) (Manila). — Gilchrist and
Thompson, Ann. South African
Mus., vol. 6, pt. 3, p. 247, 1909
(Natal); Ann. Durban Mus.,
vol. 1, ^{pt. 4,} p. 394, May 21, 1917 (reference).
— Chabanaud, Rev. Océanogr.
Pêch. Indo Chine, 1^{re} note, p. 22,
1926 (Tonkin).

Rastrelliger microlepidotus
Barnard, Ann. South African Mus.,
vol. 21, pt. 2, p. 796, Oct. 1927
(Natal).

59

Scomber loo (not Lesson) Kner, Reise
Kovara, Fische, p. 142, 1865 (Java;
Manila). — Steindachner, Sitzs. Ber.
Akad. Wiss. Wien, math.-naturw.
Kl., vol. 57, pt. 1, p. 987, 1868 (Java;
Manila; Hong Kong).

Scomber moluccensis (not Bleeker)
Steindachner, Sitzs. Ber. Akad. Wiss.
Wien, math.-naturw. Kl., vol. 57, pt.
1, p. 988, 1868 (Bleeker's Cape of Good
Hope material).

Scomber kanagurta (not Rüppell)
Klunzinger, Verh. zool. bot. Gesell.
Wien, vol. 21, p. 441, 1871 (part); Fische
Roth. Meer., vol. 1, p. 109, 1884 (part).
— Jordan and Evermann, Proc. U.
S. Nat. Mus., vol. 25, p. 336, 1902
(Formosa). — Fowler, Journ. Acad.
Nat. Sci. Philadelphia, ser. 2, vol.
12, p. 506, pl. 12, upper fig., 1904
(Padang, Sumatra); Proc. Acad.
Nat. Sci. Philadelphia, p. 757,
1904 (Jan. 30, 1905) (Padang material;
Liden). — Bean and Wee, Proc. U.
S. Nat. Mus., vol. 42, p. 602, 1912
(Batavia; part). — Van Kampen,
Bull. Dép. Agric. Ind. Néerl., no.
8, p. —, pl. fig., 1907 (Batavia).
→ Fowler and Bean, Proc. U. S. Nat.
Mus., vol. 62, art. 2, p. 18, 1922 (Takao;
Padang material). — Fowler, Mem.
Bishop Mus., vol. 10, p. 132, 1928
(part).

61

Rastrelliger kanagurta Jordan and
Richardson, Mem. Carnegie Mus., vol.
4, no. 4, p. 177, Aug. 28, 1909 (Formosa
record).

Depth 4 to $4\frac{1}{3}$; head $3\frac{3}{4}$ to $3\frac{4}{5}$, width 2 to $2\frac{1}{10}$. Snout $3\frac{1}{3}$ to $3\frac{1}{2}$ in head from snout tip; eye $3\frac{1}{2}$ to $4\frac{1}{8}$, $1\frac{1}{8}$ to $1\frac{1}{4}$ in snout, $1\frac{1}{4}$ to $1\frac{1}{3}$ in interorbital, broad adipose lids exposing median third of eye; maxillary reaches to or $\frac{1}{8}$ in eye, length $2\frac{2}{5}$ to $2\frac{2}{3}$ in head from snout tip; interorbital 3 to $3\frac{3}{5}$, low, depressed or flattened medianly. Gill rakers $13 + 21$ to 25, length $1\frac{1}{8}$ in gill filaments, which equals eye.

Scales 148 to 150 in lateral line to caudal base; 13 above, 24 below; 23 to 25 predorsal. Scales with circuli vertical, fine, all more or less parallel, only slightly diverging at scale center and circuli 86 to 88 in transverse count horizontally.

8 Pt. 100

Follow Lit

134780

117

Underscored figs. class 12/26

Q
dispilurus, 302.
dubius, 315, 328.
filamentosus, 271, 272, 305.
filifer, 319.
flavolineatus, 264.
fraterculus, 302.
griseofrenatus, 288.
immaculatus, 303.
indicus, 287, 303.
janseni, 317.
japonicus, 263.
lateristriata, 279.
lateristriga, 279.
luteus, 303, 304, 305, 313, 318.
luzonius, 320, 324.
macronemus, 279.
malabaricus, 288.
mauritianus, 265.
moana, 296.
moiavan, 284.
moluccensis, 320, 328.
multifasciatus, 294, 296, 300, 302, 306, 309.
natalensis, 303.
oxycephalus, 305.
pleurospilos, 273, 302, 304, 318.
pleurospilus, 273.
pleurostigma, 275.
pleurotaenia, 302.
porosus, 259.
porphyreus, 310.
prayensis, 271.

D. X - II, 11, I + 5, third spine $1\frac{4}{5}$ to 2 in total head, first branched ray $3\frac{1}{5}$ to 4; A. II, 10 + 5, first branched ray $3\frac{7}{8}$ to $4\frac{1}{3}$; caudal $1\frac{1}{3}$ to $1\frac{1}{2}$, widely forked; least depth of caudal peduncle 8 to $8\frac{1}{4}$; pectoral 2 to $2\frac{1}{8}$, rays I, 19; ventral I, 5, fin $2\frac{1}{3}$ to $2\frac{3}{5}$ in total head length.

Dark greenish or blue gray to slaty, sides and below white with silvery. Back with several rows of slightly darker spots. Fins pale brown, spinous dorsal dark brown terminally. Iris whitish.

Red Sea, Aden, Zanzibar, Natal, Cape Province, India, Andaman, Nicobars, Malaya, East Indies, Philippines, Siam, Tonkin, China, Formosa, Melanesia.

8 Pt. 1. 1953

Follow Lit

134783 115

Underscored fasc. 12/25

Q

- caeruleus, 320.
- dubius, 328.
- ol* fasciatus, 328.
- filifer, 319.
- flavolineatus, 264.
- indicus, 288.
- japonicus, 321.
- kuiskuiana, 340.
- luzonius, 325.
- moluccensis, 328.
- philippinus, 335, 338
- roseus, 328, 329.
- rubriniger, 319.
- subvittatus, 324.
- sulfureus, 330.
- sulphureus, 328, 330.
- sundaicus, 325, 325, 326.
- taeniopterus, 325, 327.
- tokisensis, 321.
- tragula, 339.
- tragulus, 340.
- variegatus, 340.
- vittatus, 300, 324, 331, 333, 334, 338, 339.
- vlamingii, 260.

upeneoides, Dentex, 91.

Q

- Latilus, 107.
- Nemipterus, 91.
- Synagris, 85, 91.

64

Ten examples. Atulayan Bay,
Atulayan Island, east coast
of Luzon. June 17, 1909. Length
85 to 130 mm.

8861. Catbalogan, off western
Samar. April 15, 1908. Length
112 mm.

22362 and 22363. Cavite
market, Luzon. June 14, 1908.
Length 118 to 122 mm.

5980. Cavite market, Luzon.
December 1, 1908. Length 102 mm.

Five examples. Cotabato,
southern Mindanao. May 20, 1908.
Length 130 to 138 mm. In poor
condition.

One example. Hinunangan beach,
Leyte. July 30, 1909. Length 85 mm.

1984. D. 5201. Limasana Island
(E.), S. 10 E., 14.80 miles (lat.
10° 10' N., long. 125° 04' 15" E.),
Sogod Bay, southern Leyte.

April 10, 1908. Length 194 mm.

[976] Lower gill rakers 23.

20162. Manila Bay, Luzon.

December 9, 1907. Length 75 mm.

Few examples. Manila market,
Luzon. March 16, 1908. Length 73
to 95 mm.

6979. Manila market, Luzon.

April 14, 1909. Length 114 mm.

12288 to 12290. Manila market,
Luzon. December 12 to 18, 1907.

Length 103 to 114 mm.

4692. Masugba Bay, China Sea
off southern Luzon. January 16, 1908.
Length 214 mm. Lower gill rakers
24.

66

One example. Iato River, Luzon,
tidal. June 18, 1909. Length 104
mm.

Three examples. Negus Point, Pinar. February 3, 1908. Length 18 to 51 mm.

10978 to 10983. Oyster Inlet,
Ulugan Bay, Palawan Island.
December 28, 1908. Length 203 to

218 mm.

^{Twenty-nine}
~~Three~~ examples. Port Bais,
Tanon Strait, east coast of
Negros. March 31, 1908. Length
33 to ⁵⁸~~48~~ mm.

Two examples. D. 5561.
Tomabal Island (NW.), S. 36° W.,
6.2 mile (lat. 5° 58' 45" N., long. 121°
01' 15" E.), vicinity of Jolo.
September 18, 1909. Length 32 to
42 mm.

13295. Gomomo Island, Dutch ⁶⁷
East Indies. December 3, 1909.
Length 175 mm. Lower gill rakers
38.

^{13554.}
~~9688~~. Tana Keke Island,
Flores Sea.. December 21, 1909.
Length 214 mm. Lower gill rakers
44.

9688. Uki Island, Bouru
Island. December 9, 1909.
Length 200 mm.

U. S. N. M., No. 76606. Tabao,
Formosa. Dr. Fred Baker. Length
230 to 238 mm. Two examples.

A. N. S. P., Nos. 27474 to 27489.
Padang, Sumatra. A. C. Harrison
and H. M. Hiller.

fuscolineata, 413, 414.

kuhlai, 411.

macroptera, 412.

macropterus, 412.

robinsoni, 409.

rusellii, 411.

russellii, 411.

russellii, 411.

russellii, 411.

sinuata, 409.

striata, 410.

undovittatus, Othonias, 369.

Pseudosciaena, 369.

undulosus, Dentex, 118, 122.

unicolor, Chrysophrys, 138, 139, 141.

Pagrus, 140, 141.

Pentapodus, 70.

Pentapus, 70.

Sparisomus, 140.

Upeneichthys, 259.

lineatus, 259.

porosus, 259.

vlamingii, 259, 260.

Upeneoides, 318.

argus, 338.

belaque, 331, 333.

bensasi, 321, 325, 326.

bivittatus, 330.

67

Genus Rastrelliger Jordan and Dickerson

Rastrelliger (Jordan and Starks)

Jordan and Dickerson, Proc. U.S.

Nat. Mus., vol. 34, September 14, 1908.

(p. 607, (Type Scomber brachysoma
Bleeker, orthotypic.)

^{petit} Body deep, compressed, fusiform. Head large, deep. Mouth large, lower jaw slightly protruded. Maxillary reaches hind edge of eye. Dentition feeble, vomer and palatines toothless. Lower gill rakers ^{36 to 5} 44, very fine and long. Intestine very long, bent several times. ^{vertebrae} Ventral 13+18. Soft dorsal and anal lower than first dorsal. Paired fins small.

Two species in the Indo-Pacific, compressed spindle like mackerels, remarkable for the very long, slender feathery gill rakers. In general appearance superficially suggestive somewhat of Ethmalosa and Brevoortia of the Clupeidae.

psittacus, 149.

puntazzo, 179.

ramak, 47.

robinsoni, 150, 151, 159, 160.

salpa, 181.

sarba, 147, 149, 151.

(Chrysophrys) sarba, 149.

sargus, 175.

schlegelii, 156, 163.

(Chrysophrys) schlegelii, 163.

sinensis, 108.

spinifer, 143.

(Pagrus) spinifer, 143.

striatus, 68.

swinhonis, 124, 164.

tumifrons, 123.

virgatus, 107.

vittatus, 69, 117.

~~vulgaris, 116.~~

Sphaerodon, 134.

euanis, 136.

grandoculis, 134.

heterodon, 135.

latidens, 135.

Sphaerodon heterodon, 136.

spilurns, Symphorus, 65.

spilurus, Pseudupeneus, 272, 280, 282.

Symphorus, 65.

Uepeneus, 280, 282, 303.

underscored egg case $\frac{12}{10}$

Analysis of Species

a.¹ Depth 3; lower gill rakers 36 to 38. brachysoma.

a.² Depth $3\frac{1}{2}$ to $4\frac{1}{3}$; lower gill rakers 38 to 45. kanagurta.

72

Rastrelliger brachysoma (Bleeker)

Scomber brachysoma Bleeker, Nat.
Tijds. ned. Indie, vol. 1, p. (355)
356, 1850 (type locality, Batavia);
Verh. Batavia. Genoot. (makreel.),
vol. 24, p. 34, 1852 (Batavia). —
Günther, Cat. Fish. Brit. Mus.,
vol. 2, p. 361, 1860 (copied). — Day,
Fishes of India, pt. 2, p. 251, 1876
(Andamans); Fauna British
India, Fishes, vol. 2, p. 204, 1889.
— Evermann and Seale, Bull.
Bur. Fisher., vol. 26, p. 61, 1906 (1907)
(San Fabian). — Gilchrist and
Thompson, Ann. South African
Mus., vol. 6, pt. 2, p. 190, 1908-11
(Natal).

Rastrelliger brachysomus Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 609, fig. 3, 1908 (Suva). — Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 796, Oct. 1927 (compiled). — Fowler, Journ. Bombay Nat. Hist. Soc., vol. 32, no. 1, p. 108, Sep. 30, 1928 (Bombay; Melanesia).

Rastrelliger brachysoma Fowler, Mem. Bishop Mus., vol. 10, p. 132, 1928 (Shortland Island; Faté, New Hebrides).

Rastrelliger kanagurta (not Rüppell) Jordan and Starks, Ann. Carnegie Mus., vol. 11, nos. 3-4, p. 440, Nov. 5, 1917 (Ceylon, Philippines, Red Sea).

74

Depth 3; head 3 to $3\frac{1}{5}$, width 2.
Snout $3\frac{2}{5}$ to $3\frac{1}{2}$ in head from
snout tip; eye $3\frac{2}{5}$ to 4, 1 to $1\frac{1}{4}$ in
snout, 1 to $1\frac{1}{8}$ in interorbital, less
than median third exposed by
wide adipose eyelids; maxillary
reaches opposite hind eye edge
or slightly beyond, broadly
sheathed by broad preorbital,
length $1\frac{9}{10}$ in head; interorbital
 $3\frac{3}{5}$ to $3\frac{3}{4}$, little elevated, broadly
flattened medially. Gill rakers
17 to 19 + 36 to 38, length $2\frac{1}{8}$ to $2\frac{1}{3}$
in head; gill filaments $1\frac{3}{4}$ to 2
in gill rakers.

Scales 98 to 100 in lateral
line to caudal base; 11 or 12
above, 20 to 26 below, 22 to
25 predorsal. Scales little
enlarged below pectoral base,

sectator, Kyphosus, 208.

segutulum, 204.

underscored figs. case 22/25

134789

100

(Leptokyphosus) gibsoni, 208.

klunzingeri, 207.

sydneyanus, 205.

Seiaena dussumieri, 413.

semicinatus, Lethrinus, 23, 39, 41.

semifasciatus, Upeneus, 291.

semiluctuosa, Corvina, 404.

Johnius, 404.

Sciaena, 404.

semiluctuosus, Johnius, 373, 392, 404.

serotinus, Enoplosus, 437.

serratus, Johnius, 390.

setifer, Chanda, 255.

Gerres, 229, 255.

setifera, Gerreomorpha, 254, 255.

setigerus, Dentex, 108.

setosus, Pentapodus, 71, 78, 79.

Pentapus, 78.

siamensis, Johnius, 373, 392.

Sciaena, 392.

signatus, Barbupeneus, 282.

Mullus, 282.

Pseudupeneus, 272, 282.

Upeneus, 271, 282.

sihama, Atherina, 417.

Sillago, 416, 417, 426, 427.

5 rows on cheek. Large scales with marginal apical fringe of 12 points; vertical parallel striae on scale 25 apically.

D. $\overline{\text{X}} - \overline{\text{II}}$, 10, $\overline{\text{I}}$ or 11, $\overline{\text{I}} + 5$, second spine $1\frac{3}{4}$ to $1\frac{4}{5}$ in total head length, first branched ray 3 to $3\frac{1}{5}$; A. $\overline{\text{I}} - \overline{\text{II}}$, 10, $\overline{\text{I}}$ or 11, $\overline{\text{I}} + 5$, first branched ray $2\frac{4}{5}$ to $3\frac{1}{5}$; caudal $1\frac{1}{3}$, deeply forked; least depth of caudal peduncle 7 to $7\frac{1}{2}$; pectoral 2 to $2\frac{1}{8}$, rays $\overline{\text{I}}$, 21; ventral $2\frac{1}{5}$, rays $\overline{\text{I}}$, 5.

Back olive, below whitish.

Iris grayish. Fins pale brown, spinous dorsal darker or dark gray marginally. Soft dorsal lobe apically and hind caudal edge with dusky. Lower fins pale or more white.

Red Sea, Natal, India, Ceylon, Andamans, East Indies, Philippines, Melanesia, Polynesia.

tahlmel, 204.

ten-lo, 385, 404.

trachycephalus, 406.

trutta, 433, 435.

umbra, 370.

vogleri, 389.

(Nipea) yeddoensis, 395.

Sciaenidae, 351.

Sciaeninae, 353.

Sciaenoides, 364.

asper, 390.

biauritus, 365.

brunneus, 366.

cochinchinensis, 364.

hardwickii, 360.

lucidus, 362.

microdon, 365.

pama, 360.

perarmatus, 361.

Sciaena, 407.

scintillans, Erythrichthys, 349.

Scolopoides cancellatus, 118.

caninus, 80.

Scolopsis caninus, 80.

tolu, 114.

Scomber auratus, 142.

japonicus, 142.

scoparius, Lethrinus, 34.

Scorpiis vinosa, 213.

Sectator, 203, 215.

azureus, 215.

17907. Sandakan market,
Sandakan, Borneo. March 4, 1908.
Length 185 mm.

U. S. N. M., No. 32693. ^{East} Indian
Archipelago. Royal Museum of Leyden.
Length 185 mm. As Scomber kanagurta.

U. S. N. M., No. 56090. San Fabian,
Philippines. Bureau of Fisheries
(3270). Length 200 mm. Depth 3.

U. S. N. M., No. 72625. Java.
O. Bryant and W. Palmer. Length
210 mm. As Scomber kanagurta.
Depth 3.

~~mi-uy~~, 395.

(Corvina) nasus, 405.

nebulosa, 4, 33.

neglecta, 400.

nibe, 395, 396.

novae-hollandiae, 383.

(Corvina) novae-hollandiae, 370, 383.

ogiwara, 369, 370.

ophiceps, 402.

osseus, 379.

pama, 360.

parva, 389.

platycephala, 375.

ramak, 47.

robinsoni, 408, 409.

russeli, 411.

russelli, 411.

~~sapidissimus~~, ~~mulloides~~, 436.

schlegeli, 395.

(Argyrosomus) schlegeli, 395.

(Pseudosciaena) schlegeli, 395.

(Pseudosciaena) schlegelii, 395.

semiluctuosa, 404.

siamensis, 392.

sina, 388.

sinuata, 408, 409.

soldado, 393.

striata, 408, 410.

Underscored figs. case 22

78
A. h. S. P., one example. Bombay, India.
Prof. F. Hallberg. Purchased. Length
230 mm.

heinii, 401.

hololepidota, 400.

hololepidota antarctica, 400.

hololepidotus, 400.

hypostoma, 397.

iharae, 395.

indica, 408, 410, 414.

japonica, 392, 394.

(Nibea) japonica, 395.

lata, 142.

leptolepis, 381.

lucida, ³⁶¹362.

~~lucidus, 362.~~

macrophthalmus, 376.

macroptera, 408, 412.

macropterus, 412.

maculata, 375, 381.

mahsena, 53.

malabarica, 418.

manchurica, 368, 369, 370.

margaritifera, 400.

marleyi, 389.

meygun, 362.

microdon, 364.

mi-iuy, 395.

miles, 393.

(Corvina) miles, 393.

mitsukurii, 386, 390.

(Nibea) mitsukurii, 391.

~~mi-uy, 395.~~

mülleri, 393.

(Corvina) mülleri, 393.

mulloides sapidissimus, 436.

Underseered figs. case 35

79

Rastrelliger kanagurta (Rüppell)

Scomber kanagurta (Cuvier) Rüppell,
Atlas Reise nördl. Afrika, Fische,
p. 93, 1828 (type locality, Gomfuda,
Red Sea). — Cuvier, Hist. Nat.
Poiss., vol. 8, p. 49, 1831 (Jan. 1832)
(Pondicherry, Red Sea, Malabar,
Gomfod). — Rüppell, Neue Wirbelth.
Fische, p. 37, 1835 (reference). —
Jerdon, Madras Journ. Lit. Sci.,
p. 135, 1851. — Bleeker, Nat. Tijds.
ned. Indie, vol. 3, p. 445, 1852
(Banka); Verh. Batavia. Genoot.
(makreel.), vol. 24, p. 34, 1852
(Batavia, Cheribon, Samarang,
Pasuruan); (hal. Ichth. Bengal),
vol. 25, p. 42, 1853 (reference); Nat.
Tijds. ned. Indie, vol. 7, p. 227,
1854 (Macassar), p. 312 (Bantem,
Anjer, Tjiringin).

80

— Peters, Archiv naturg., p. 245, 1855
(Mozambique). — Bleeker, Nat.
Tijds. Ned. Indie, vol. 8, p. 393,
1855 (Amboina); vol. 9, p. 282,
1855 (Macassar), p. 394 (North
Pasuruan); Nat. Soc. Sci. Ind.
Ned. (Sumatra), vol. 8, p. 12, 1859
(Benculen); Nat. Tijds. Ned. Indie,
vol. 20, pp. 237, 449, 1859-60 (Singa-
pore); vol. 21, p. 138, 1860 (Muntok,
Banka). — Günther, Cat. Fish.
Brit. Mus., vol. 2, p. 360, 1860
(reference). — Kner, Reise Novara,
Fische, p. 142, 1865 (Java). — Day,
Fishes of Malabar, p. 68, 1865. —
Bleeker, Ned. Tijds. Dierk., vol. 2,
p. 34, 1865 (Siam), p. 173 (reference).
— Steindachner, Sitzb. Ber. Akad.
Wiss. Wien, math.-naturw. Kl., vol.
57, pt. 1, p. 989, 1868 (no locality).

81

— Klunzinger, Verh. zool. bot. Gesell.
Wien, vol. 21, p. 441, 1871 (Red Sea). —
Gunther, Journ. Mus. Godeffroy,
vol. 5, pt. 11, p. 149, 1876 (Peleu
Islands; Fiji). — Klunzinger,
Fische Roth. Meer., p. 109, 1884
(Koseir). — Fowler, Mem. Bishop
Mus., vol. 10, p. 132, 1928 (Samoa),
Proc. Acad. Nat. Sci. Philadelphia,
vol. 83, p. 444, 1931 (Kuala Pahang,
east coast of Malaya).

82

Scomber kanagurta Cuvier, Règne Animal,
ed. 2, vol. 2, (April 1829) p. 197 (on
Kanagurta Russell, Fishes of Coromandel,
vol. 7, (1803), p. 28, pl. 136, (Vizagapatam).
type locality,

Rastrelliger kanagurta McCulloch,
Mem. Austral. Mus., vol. 5, pt. 2,
(September 10, 1929) p. 261, (reference).

Rastrelliger kanagurta Fowler, Proc. Acad. Nat.
Sci. Philadelphia, vol. 87, p. 138, 1935 (Bangkok; Madras).

Scomber loo Lesson, Dict. Class. Hist.
Nat., vol. 15, (1829) p. 277 (type locality,
Port Praslin, New Ireland). —

^{Cuvier}
Valenciennes, Hist. Nat. Poiss., vol.
8, (1831) p. 52, (Praslin; Waigiu;
Dorey, New Guinea). — Lesson, Voy.

Cochuille, Zool., vol. 2, pt. 1, 1830
(1831) (p. 166, pl. 33) (Praslin; Waigiu;
Dorey).

— Bleeker, Nat. Tijds. Ned. Indie, vol. 2,
(1851) p. 210, (Boeloekomba); vol. 3, ~~1852~~,
p. 235, (Amboina), p. 741 (Boeloekomba);
Verh. ¹⁸⁵² Batavia. Genoot. (Nakreel.),
vol. 24, (1854) p. 35, (Batavia); Nat.
Tijds. Ned. Indie, vol. 4, (1853) p. 596,
(Halmaheira), p. 604 (reference); vol. 5,
(1853) p. 319, (Amboina); vol. 6, ~~1854~~, p.
p. 50¹⁸⁵⁴, (Sindangole), p. 457 (Amboina);
vol. 7, (1854) p. 361, (Batjan); vol. 8,
(1855) p. 296, (Ternate); vol. 9, ~~1855~~, p.
394¹⁸⁵⁵, (North Pasuruan), p. 492 (Batjan);
vol. 10, (1856) p. 347, (Rio, Bintang);
vol. 11, (1856) p. 95, (Banda); Act. Soc.
Sci. Ind. Néerl., vol. 1, no. 3, ^{p. 42} 1856 ~~1856~~
~~1856~~ (Manado), p. 9 (Macassar); no. 5, ^{p. 6} 1856,
~~1856~~ (Amboina); Nat. Tijds. Ned.
Indie, vol. 13, (1857) p. 384, (Batjan),
p. 479 (Prigi, Java); Act. Soc. Ind.
Néerl., vol. 2, no. 7, (1857) p. 5, (Amboina);
Nat. Tijds. Ned. Indie, vol. 17, ^{p. 130} 1858-59,
~~1858~~ (Oetapoepe, Timor), p. 142
(Boeling, Bali); Act. Soc. Sci. Ind.
Néerl., vol. 5, no. 8, 1858-59, (p. 2)

(Tobariri, Celebes); Nat. Tijds. Ned.
Indie, vol. 20, p. 198, 1859-60
 (Badjoa). — Günther, Cat. Fish.
Brit. Mus., vol. 2, p. 360, 1860
 (reference). — Bleeker, Ned. Tijds.
diérb., vol. 1, p. 270, 1863 (Utapupu,
 Timor); Verslag. Akad. Wet.
Amsterdam, ser. 2, vol. 2, p. 291,
 1868 (Rio, Bintang), p. 300 (Waigiu);
Arch. Néerl. Sci. Nat. Harlem,
 vol. 13, p. 37, 1878 (New Guinea): —
^{Macleay, Proc. Linn. Soc. New}
^{South Wales, vol. 7, p. 359, 1882}
 (New Guinea); vol. 8, p. 266, 1883
 (Pitt Bay, Moresby Island, New-
 Guinea). — Jordan and Seale,
Bull. Bur. Fisher., vol. 25, p. 228,
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locality, Andamans).

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Day, Fishes of India, pt. 2, p. 250,
1876 (part) — Fowler, Copeia, no. 58, p. 63, June 18,
1918 (Philippines); Journ. Bombay Nat. Hist. Soc., vol. 30, no. 2,
p. 316, Jan. 25, 1925 (Calicut).

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—, pl., fig., 1907 (type locality,
Java Sea, Batavia).

Rastrelliger chrysazonus (not Rüppell)
Kishinouye, Journ. College Agric.
Tokyo, vol. 8, no. 2, p. 406, figs. W, 63,
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China; Formosa; Truk Island).

(87)

Depth $3\frac{1}{2}$ to $4\frac{1}{3}$; head $3\frac{1}{8}$ to $3\frac{1}{2}$,
width $2\frac{1}{8}$ to $2\frac{1}{2}$. Snout $3\frac{1}{5}$ to $3\frac{1}{3}$
in head from snout tip; eye 4 to
 $5\frac{1}{8}$, $1\frac{1}{4}$ to $1\frac{3}{5}$ in snout, 1 to $1\frac{2}{3}$ in
interorbital; maxillary reaches
 $\frac{3}{5}$ to or opposite hind eye edge,
^{expansion $1\frac{1}{5}$ in eye,}
length $1\frac{7}{8}$ to $2\frac{1}{10}$ in head from
snout tip; interorbital $3\frac{1}{8}$ to 4,
low, level. Gill rakers 16 to 26 +
38 to 45, with age nearly twice
gill filaments, which $1\frac{1}{5}$ in eye.

Scales 110 to 128 in lateral line
to caudal base; 12 or 13 above,
23 or 24 below, 26 to 28 predorsal;
5 or 6 rows of narrowly imbricated
scales on cheek. Scales with 20 to 25
fimbriate marginal apical points;
30 to 32 basal circuli.

D. IX or X — I, 10 + 5, second spine
2 to $2\frac{1}{8}$ in total head length, first
branched ray $3\frac{3}{5}$ to $3\frac{2}{3}$; A. I — I, 10 +

Unscored figs. case 22

bilobatus, 147.
boops, 180.
brama, 184.
britannus, 237.
bufonites, 149.
calamara, 158.
berda var. calamara, 158.
cantharus, 182.
cardinalis, 170.
(Pagrus) cardinalis, 170.
castelnaui, 146.
centrodontus, 171.
choerorhynchus, 4, 45.
chrysopterus, 155.
coracinus, 146.
crenicens, 201.
cristiceps, 148, 166.
cuvieri, 147, 161.
datnia, 155.
(Chrysophrys) datnia, 155.
dentatus, 148, 168.
dentex, 85, 116.
durbanensis, 147, 153.
edentulus, 250.
erythrinus, 171.
erythrourus, 237, 239.
fascialis, 146.
filamentosus, 148, 168.
forsteri, 68.

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5, first branched ray $3\frac{1}{2}$ to 4; caudal $1\frac{2}{5}$ to $1\frac{1}{2}$, widely forked; least depth of caudal peduncle $7\frac{1}{3}$ to $7\frac{4}{5}$; pectoral $2\frac{1}{10}$ to $2\frac{1}{8}$, rays II, 18; ventral I, 5, fin $2\frac{2}{5}$ to $2\frac{2}{3}$ in total head length.

Back and above brown, with 3 longitudinal rows of dark spots. Sides and below whitish. Fins pale brown. Dorsals and caudal little darker.

Red Sea, Mozambique, Madagascar, Cape of Good Hope, India, Andamans, Malaya, East Islands, Philippines, Siam, China, Hainan, Formosa, Riu Kiu, Melanesia, Polynesia.

a/ byena, 236.

porosus, 71.

smithii, Dentex (Heterognathodon), 111.

Q Synagris, 87, 111.

socotranus, Gerres, 268, 239.

soldada, Corvina, 392.

soldado, Corvina, 392.

a/ Holocentrus, 392.

Johnius, 373, 388, 392.

Sciaena, 393.

sordidus, Lethrinus, 58, 59.

Sparidae, 64.

spariformis, Dentex, 118, 124.

Sparisoma, 138.

Sparisomus unicolor, 140.

~~Sparisoma, 138.~~

Sparosoma, 138.

Sparosomus, 138.

Sparus, 64, 145, 147, 148.

a/ acutirostris, 179.

anglicus, 147, 164.

annularis, 175.

argentatus, 394.

aries, 150.

aurata, 145.

auratus, 139, 142.

aureo-lineatus, 76.

australis, 147, 151, 152.

berda, 147, 157.

bifasciatus, 147, 160.

(Chrysophrys) bifasciatus, 160.

Underlined figs. case 22

8911. Atulayan Bay, Lagonoy Gulf, Atulayan Island, east coast of Luzon. June 17, 1909. Length 338 mm.

7778 to 7788. Balabac, Candaraman Island, north Balabac Strait. January 4, 1909. Length 274 to 328² mm.

8680. Batag Island, east coast of Luzon. June 2, 1909. Length 280 mm.

8952 and 8953. Between Paron and Jesus Point, Albay Gulf, east coast of Luzon. June 21, 1909. Length 307 to 310 mm.

8025. Capulaan Bay, Pagbilao, Chica Island, Marinduque vicinity. February 24, 1909. Length 290 mm.

5978, 5982. Cavite market,
Luzon. December 1, 1908. Length
93 to 94 mm.

7435 and 7436. Guntao
Island, Flores Sea. December 20,
1909. Length 327 mm.

20161. Manila Bay, Luzon.
December 9, 1907. Length 74 mm.

8213 and 8214. Refugio Island,
Pasacao Anchorage, Ragay Gulf,
Luzon. March 9, 1909. March 9, 1909.
Length 278 to 295 mm.

9122. San Roque, Leyte.
July 29, 1909. Length 263 mm.

7143 and 7144. West coast of
Paluai Island, off northern
Luzon. November 18, 1908. Length
280 to 293 mm.

U.S. N. M., No. 94771. Hainan
China. Lin. ^{1934.} Length 255 mm.
Depth $3\frac{1}{4}$.

U. S. N. M., No. 52492. Apia.
Bureau of Fisheries. Length 340 to
343 mm. As Scomber loco. Two
examples.

U. S. N. M., No. 56092. Bacon.
Bureau of Fisheries (4173). Length
260 mm.

U. S. N. M., No. 56330. Cavite.
G. K. Lung. Length 197 to 260 mm.
Five examples.

U. S. N. M., No. 58040. Zamboanga.
Dr. E. A. Mearns. Length 270 to 272 mm.
Two examples.

U. S. N. M., No. 72227. Manila.
R. C. McGregor. Length 72 to 138 mm.
Four examples.

U. S. N. M., No. 72621. Batavia.
April 2, 1909. O. Bryant and W. Palmer.
Two 150 mm. (one very poorly preserved).
This and the following all as
Scomber kanagurta.

macrolepis, 416, 424, 425.

maculata, 416, 419, 422, 423, 430.^{425,}

maculato, 416.

malabarica, 418.

panijus, 433.

parvisquamis, 416, 427.

punctata, 431.

punctatus, 416.

robusta, 423.

sihama,, 416, 417, 426, 427.

terrae-reginae, 429, 430.

similis, Neolethrinus, 63.

Simocantharus, 182, 185.

simplex, Crenidens, 187, 191.

Girella, 191.

Incidens, 192.

Melanichthys, 192.

simus, Cantharus, 185.

sina, Corvina, 376, 388, 395, 396.

Johnius, 373, 388, 389.

Sciaena, 388.

sinensis, Dentex, 108.

Nemipterus, 108.

Sparus, 108.

Synagris, 108.

singaporensis, Gerres, 231.

sinuata, Sciaena, 408, 409.

Umbrina, 409.

Smaris balteatus, 346.

gracilis, 107.

underscored figs. case ²² ~~25~~

U. S. N. M., No. 72622. Batavia.

April 2, 1909. O. Bryant and W. Palmer.
Length 145 to 164 mm. Seven examples.

U. S. N. M., No. 72623. Batavia.

April 2, 1909. O. Bryant and W. Palmer.
Length 106 to 115 mm. Two examples.

U. S. N. M., No. 72624. Batavia.

April 2, 1909. O. Bryant and W. Palmer.
Length 100 to 122 mm. Two examples.

U. S. N. M., No. 72626. Batavia.

April 2, 1909. O. Bryant and W. Palmer.
Length 158 mm.

One example, U. S. N. M. Bombay.

Dr. F. Hallberg. Purchased. Length
230 mm.

sihamus, Platycephalus, 417.

Silago, 415.

ihama, 418.

Sillaginae, 415.

Sillaginichthys, 432.

Sillaginidae, 415.

Sillaginodes, 415, 421, 431.

punctata, 431.

Sillaginopodys, 416, 430.

Sillaginopsinae, 415.

Sillaginopsis, 415, 432.

domina, 433.

panijus, 432.

Sillago, 415, 416.

acuta, 415, 419.

aeolus, 424, 425.

bassensis, 416, 422, 423, 429.

bostockii, 422.

boutani, 416, 421, 422.

burrus, 424, 425.

chondropus, 416, 430.

ciliata, 416, 422, 428.

diadoi, 429.

domina, 416, 432.

erythraea, 419.

gracilis, 419, 424, 425.

insularis, 429.

japonica, 416, 425, 427.